

The Wrack Line

Newsletter of Parker River National Wildlife Refuge • Newburyport, MA



United States Fish & Wildlife Service

Summer, 2017

Coyotes Find Refuge Right Here at Parker River!

by Dominic Noce, Refuge Intern

My passion is to become a wildlife biologist to help reverse the catastrophic population decline of large predators through rewilding projects. I recognize the critical role that large predators play in maintaining healthy ecosystems and aim to educate the public on their importance and work with governments to reestablish their former ranges.

In 2013, as a freshman at Newburyport High School, I joined the [Gulf of Maine Institute](#) (GOMI), which fosters youth-led initiatives in the United States and Canada to protect the Gulf of Maine watershed. As a member of the Newburyport GOMI Team, I help initiate positive environmental change through involvement in local team and collaborative partner projects, community education, and government. Starting my sophomore year, I began my search for a predator-based GOMI project on which to volunteer. I did not immediately succeed and encountered many dead ends and detours. In February 2016, I met with Parker River National Wildlife Refuge Manager Bill Peterson and we agreed to use scent stations and camera traps to monitor areas of the refuge for coyote activity since these methods do not require a permit. The project evolved into a first semester Wildlife Biology Internship for school credit my senior year. I arranged the internship myself through my contacts at the refuge; it was not previously available at Newburyport High School.

I began the internship in September 2016, using my camera trap footage to analyze common times the coyotes visited the stations and to identify and observe other species that thrive in coyote territory. I captured my first coyote on camera in December, a male. He was an impressive size with many wolf-like markings on his coat. Contrary to his appearance, he was extremely shy and wary around the

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Photo: Dominic Noce

Coyote photo taken by the author using a trail camera, a rugged and weatherproof camera designed for extended and unmanned use outdoors.

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New England Cottontail Breeding Expanded at Great Bay NWR

by Kaytee Hojnacki, Biological Technician

While it was determined by U.S. Fish & Wildlife Service that the New England Cottontail (NEC) did not warrant listing under the Endangered Species Act, that hasn't stopped many individuals from continuing to actively work toward increasing their populations. In all New England states the population of this native rabbit remains low, so low that in New Hampshire and Maine they are state-listed as endangered and are a species of special concern in Rhode Island. Although a captive breeding program has been on-going for numerous years, it has a limited capacity due to the size of the facilities. To increase the number of NEC young produced each year that can be released into New Hampshire to supplant the existing wild population, we continued our partnership with the NH Fish and Game Dept. (NH F&G) to use our 1-acre pen at Great Bay NWR for breeding of these rabbits in a more natural setting. As you might remember from my *Wrack Line* article from Fall 2015, we had some success, producing two young rabbits.



All Photos: Matt Poole/FWS

Clockwise from left:

NH Fish and Game Department's Brett Ferry processes an adult bunny (in the blue bag) before re-releasing it into the captive breeding pen.

After being trapped in the breeding pen, this adult rabbit was radio-collared and then re-released into the pen.

The entrance to one of two new 8-acre captive rearing pens recently built within the former weapons storage area at Great Bay NWR.

From that experience, the refuge and NH F&G decided that was necessary to have a successful breeding program was bigger pens with more habitat for rabbits to find their niche, and avoid predators. In 2016, NH F&G (with some help from the refuge) worked on retrofitting the existing weapon's storage area perimeter fence and building two new cross fences to turn the southern section of the storage area into two 8-acre pens. In April of this year, after we confirmed that all eastern cottontails were removed, NH F&G introduced 12 NEC (6 of each gender) from the breeding program on Patience Island, RI. They were all radio-collared in order to keep track of their survival while in the pen, which helped us determine that two of the females were depredated by aerial predators within the first few weeks.

NH F&G has been leading this effort, hiring a summer technician to monitor the rabbits and the pen. Trail cameras were placed out and by early June, images of young rabbits were collected. The first round of live trapping in mid-June only caught three of the adults. But a second round of trapping in late July captured five young, along with six adults, one of which had slipped out of its collar earlier in the summer. All young were radio collared like their parents and released back into the pen. We need to wait for the results from DNA testing to confirm that they are New England cottontails before we release them into the wild.

This initial success has all of us involved with this project excited about the future. Maine Dept. of Inland Fisheries & Wildlife has contributed money to the project with the goal of being able to release some of the young produced in the pens into their state to help boost dwindling populations there. Next spring, we hope to obtain more NEC adults and will hopefully be using both of the large pens, producing double the number of young. The Great Bay NWR-produced NEC young, combined with the young rabbits that New Hampshire is still receiving from the zoo captive breeding program (in Providence, RI), will hopefully lead to a bright future for the New England cottontail!

Like a Fine Wine, LGO Just Keeps Getting Better!

by Matt Poole, Visitor Services Manager

We all know that refuges are special places for wildlife. But refuges are special places for people as well, as many readers here will attest. They are places to connect with nature, places to witness wildlife in their wild habitats and, particularly since former Secretary of the Interior Ken Salazar first launched the **Let's Go Outside** campaign in 2009, places where the public can participate in organized opportunities to try out and experience traditional outdoor activities that are fun, physically active, and otherwise healthy.

Parker River National Wildlife Refuge held its third annual Let's Go Outside! (LGO) event on Saturday, June 17. While the day began under the threat of rain, the skies eventually cleared, paving the way for a well-attended and otherwise successful event. Approximately 300 kids and adults participated in the daylong event.

Most event goers began at the visitor center. After receiving a hearty welcome and proper orientation, they moved through three distinct activity stations. The birding station focused on the basic mechanics of using binoculars — something that can be a bit of a challenge for first time users. At the nature photography station participants used refuge-provided cameras to photograph several live animals, including an American alligator and a parrot. Finally, Katie Hone, The Monarch Gardener, was on hand to engage folks in a range of fun, hands-on activities related to the increasingly rare (and charismatic) monarch butterfly. (You simply can't go wrong with monarchs as an engaging topic!). Owl pellet dissection, along with a number of fun craft activities, rounded out the offerings at the visitor center. From there, participants next headed over to the refuge.

The initiative to promote outdoor physical activity and to connect children and families to nature was launched in 2009 by former Secretary of the Interior Ken Salazar.

For most visitors, Parking Lot 1 was likely their first stop on the refuge. Inside the visitor contact station biologist Ellen Goethel did her usual bang-up job with a fascinating tide pool touch tank. (Again, there is nothing that out-competes live animals for a child's or adult's attention!). A tent in the corner of the parking lot was the place to get your face painted with artful animal designs. Then it was a quick walk out to the Lot 1 beach to learn how to surf fish. The image of a parent, or even older sibling, helping a youngster to cast a line into the ocean has become one of the prototypical "Kodak Moments" of LGO!

Sub Headquarters was the place to plunk arrows into a target. Kind of a hyper-thyroidal version of darts, archery target shooting is always a big time fave among event goers. And it's an outdoor activity that can be enjoyed, at relatively low cost, in your own driveway. (Incidentally, just in the last several years, many national wildlife refuges across the country have started up their own youth archery programs.)

What a vision to behold — people kayaking in a refuge impoundment! For the third year in a row, event participants patiently waited for their turn to paddle one of [Plum Island Kayak's](#) boats — this year in the Bill Forward Pool. Once again, smiles and laughter were all one needed as proof that LGO was hitting the mark!

LGO is the refuge's biggest annual public event. It's an undertaking that has many moving parts and therefore requires a lot of help — from staff, volunteers, and the [Friends of Parker River NWR, Inc.](#) It's that team approach that leads to the success. I want to express my sincere thanks to all who were involved this year!

Check out some of the action at LGO ➔

A Few Glimpses from “Let’s Go Outside!”



All Photos: Matt Poole/FWS

Clockwise from top:

The Bill Forward pool, resplendent with a rainbow of kayaks on a Saturday afternoon in June.

Youngsters, and not-so-youngsters, along the archery firing line.

Refuge manager Bill Peterson teaching a young girl how to cast with a surf-fishing rod.

Refuge volunteer Lynette Leka facilitating purple martin viewing.

A refuge summer interns provides one-on-one archery instruction.

Reaching out to Urban Youth in a Rural Environment

by Jean Adams, Outdoor Recreation Planner

Recently, I had the opportunity to travel to one of Parker River's satellite refuges — Wapack NWR in Greenfield, NH. Weston Forsblad (one of our Ranger Naturalist Program graduates), SCA intern Colin Brown, and myself ventured to Brantwood Camp, conveniently located across the street from the refuge parking lot on Old Mountain Road. Our goal was to do some urban outreach.

Urban outreach in rural southwestern New Hampshire, you ask? Yes, because Brantwood Camp focusses on exposing urban youth to nature in a rural setting. Most of the campers were from places like New York City, Jersey City, and Boston. Many who attend the camp are able to do so because of scholarship assistance.

The 14- and 15-year-old boys and girls that we worked with were all very excited to be attending a camp in such a beautiful and remote location. Everything there is new to these kids: trails, trees, ponds, and local wildlife.



Weston Forsblad explains how "game cameras" are used to photograph wild animals unobtrusively when people are not present.



Volunteer Refuge Naturalist Weston Forsblad introduces the campers to the skins and skulls of animals that are native to the area.

We spent some time introducing them to the native wildlife of the area by showing them skins and skulls (e.g., bear, coyote, fox, and weasel). Next, we introduced them to game cameras. After talking about how the cameras can be used (e.g., such as seeing what is in our yards or scouting for hunting), we led the kids onto the refuge trail and had them set up their own "camera traps." The kids served as their own wildlife and got captured "in action." They got a big kick out of viewing the photographic results.

All and all it was a fun day for the kids and the counselors who accompanied us. It was good to expose these kids to something they didn't even know existed (game cams) and, in process, they learned about habitats and the animals they were likely to see while at camp this summer. Hopefully, they enjoyed their time in the refuge woods and will remember what they learned long after returning home.

High-Quality Bird Photography Done on the Cheap (sort of ...)

by Matt Poole, Visitor Services Manager

While I do spend a lot of time outdoors taking pictures — including on our beloved, local national wildlife refuge — I’ve certainly never considered myself a bird photographer. Bird photography is a realm that has traditionally been reserved for those who tote around those REALLY BIG lenses that, because of their length and weight, are almost always seen sitting on equally impressive-looking carbon fiber tripods. Those are the lenses that have the necessary focal length, or “reach,” to allow the photographer to fill the frame with a bird that might be located 100 yards out in the salt marsh. Those also just happen to be the lenses that cost between \$8,000–\$12,000!

For those of us with more modest equipment, and with proportionally more modest budgets, the birds in our photographs tend to occupy a smaller portion of the image frame. This can be a very good thing if your goal is to create an environmental portrait that conveys how an animal relates to or interacts with its environment. Such an image can be every bit as powerful, or even jaw-dropping as a frame-filling, close-up portrait. Also, there are indeed some species of birds — gulls, swans, ducks, geese, and feeder birds — that can become habituated to human presence and will therefore tolerate having their picture taken at a closer proximity.

But that was then and this is now. Because the digital photography market has become so competitive over the last several years, camera and lens manufacturers are constantly trying to outdo their competitors in every sector of the market; e.g., pro, “prosumer,” and consumer. Photographers who have long desired to fill the frame with images of birds and other wildlife, but were unwilling to take out a second mortgage to achieve that goal, are starting to benefit from the recently reinvigorated competition for market share. And this benefit has taken two distinct forms.

First, there are now point-and-shoot cameras with ultra-zoom lenses. The reach on some of these cameras exceeds the mightiest of the traditional (and

very expensive) bird lenses that I addressed above. The typical pro bird photographer shoots with a 500 or 600 mm telephoto lens. All of the images that accompany this article were taken with an ultra-zoom point-and-shoot camera that has an equivalent maximum focal length of 1200 mm! That camera cost about \$550 compared to the \$12,000 bird lens. So, while I’d be the first to admit that the quality of an image taken with a point-and-shoot is not as good as you’d get from that monster lens, the images are certainly good enough to show to you in this article!

Second, there is a new breed of very affordable big zoom lenses that, when companioned with a digital single lens reflex (DSLR) camera, immediately places the modest-budgeted shutterbug in the same reach zone as the professional wildlife photographer. The price point for these new zoom lenses hovers in the \$1200–\$1500 range. (Did you notice that there is one less “0” when compared with the cost of the pro telephoto lenses?)

In summary, these are wonderful times if you’re into wildlife photography. While I have no illusions about putting the likes of Jim Brandenburg out of a job anytime soon, there is great satisfaction in the fact that I can now fill the frame with a far-off critter if I want to. Technology and market forces have levelled that particular playing field.

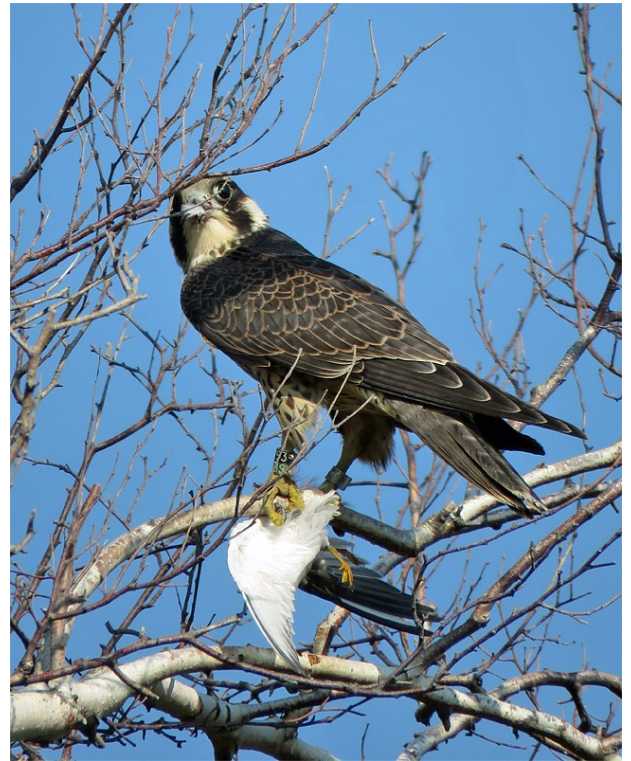
Happy shutterbugging!

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High-Quality Bird Photography Done on the Cheap!

All photos by Matt Poole/FWS



Top-left: Osprey landing

Top-right: Heron

Bottom-left: Wet plovers

Bottom-right: A peregrine eating a least tern

All images on this page were taken with the affordable Canon Powershot SX60 (ultra-zoom point-and-shoot) camera with 65X optical zoom.

A Brief History of Now Long-Forgotten Grape Island

by Alix McArdle and Kate Murray, Refuge Volunteers

What is now one of the most inaccessible regions of the Parker River National Wildlife Refuge was once the most populated, inhabited by enough year-round families to warrant a schoolhouse (1843—1916, grades up to 6th, capacity 20 students).

Grape Island is the tree-covered land on the western edge of the salt marsh, clearly visible just south of Lot #5. It is about 80 acres in size, nearly one mile long and less than a quarter of a mile wide. At its northernmost end, it's attached to Plum Island by a small stretch of high marsh, and full tides running the Pine and Grape Island Creeks frequently flood the isthmus attaching the two islands. It is for this reason Nancy Weare reports in her book, the free ranging livestock of the 1600s (outlawed in 1739) did not venture onto Grape Island, resulting in the retention of the topsoil that was lost on most of Plum Island. When homesteaders began arriving by boat from Ipswich's Great Neck in the 1670s, they found fertile soil able to support their vegetables, fruit trees, and berry bushes. Although wells were poor, the use of cisterns and catch basins made keeping chickens and a few cows possible, and because of this modest farming, Grape Island remained continuously occupied year-round right up until 1984 when its last full time resident, Lewis Kilborn (who moved to Grape Island one week after his 1906 birth on Lime Street in Newburyport) died. The Kilborn family had lived on Grape since at least 1865, according to a deed transfer.

Unlike Stage Island (see *Spring 2017 Wrack Line*), whose business ventures were short lived (the Salt Works, the fish drying "stages") and which became a seasonal destination for area residents, Grape Island maintained its population by sustainable farming; abundant fishing, clamming, lobstering, and hunting; salt marsh haying; housing the surfmen from the Knobbs life-saving station; and later attracting tourists. By the late 1800s it had become a favorite destination of upriver guests from Newburyport, Amesbury, and even Haverhill, who arrived by boat and rented a cottage, tent, or a room in the big hotel repurposed in 1880 by Captain Thomas Mackinney from a large private home originally constructed in

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Grape Island (center) located on the refuge's western shore.



A Close-up Aerial Photograph of Grape Island

A Brief History of Now Long-Forgotten Grape Island

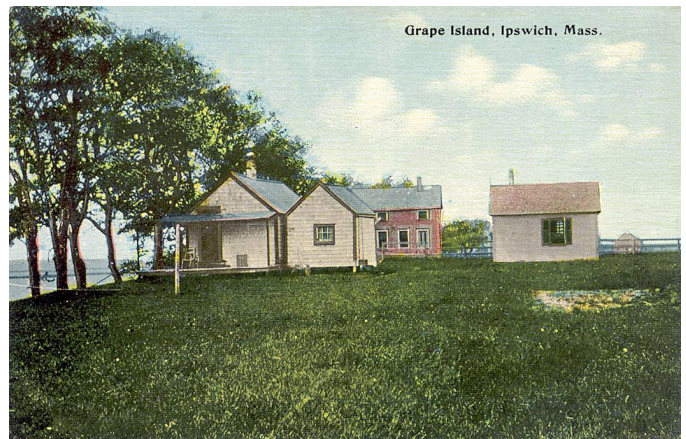
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1840 by Moses Adams. In 1896 a second hotel, this one at the south end of the island, was built (with some lumber salvaged from a beached schooner) by John Post, who had managed his brother-in-law Mackinney's place for several years. In time a dance pavilion, a bar/casino, and other amenities were added to offer the complete vacation package. The businesses generated by the hotels and cottages supported the local farmers and fishermen and provided cash-paying housekeeping and restaurant jobs for other islanders.

Life on Grape Island was not easy, but it did have a simplicity and enduring quality that kept many of the original homesteading families there for generations. Charles A. and Emma Bayley (daughter of Samuel Small, granddaughter of James who settled on the island in 1868), the great grandparents of Stephanie Cobb (who has assembled her father's albums and supplied us with many photographs and recollections), raised a family of 10 children. While it's not known how many of the islanders returned to the mainland in the winter (all returned for their final rest, as there are no cemeteries on Grape), it's understood that enough remained to warrant the town of Ipswich to construct a schoolhouse in 1843. Teachers (over several decades two women held

this position almost exclusively) commuted from Ipswich on the livery boat or by way of the steamer Carlotta; however, they often had to stay overnight with locals if the weather so dictated. The April-to-early winter school year, necessitated by the not uncommon freezing of waters in the sound, proved to be problematic for island children who wished to join the fun when vacationers arrived in June.

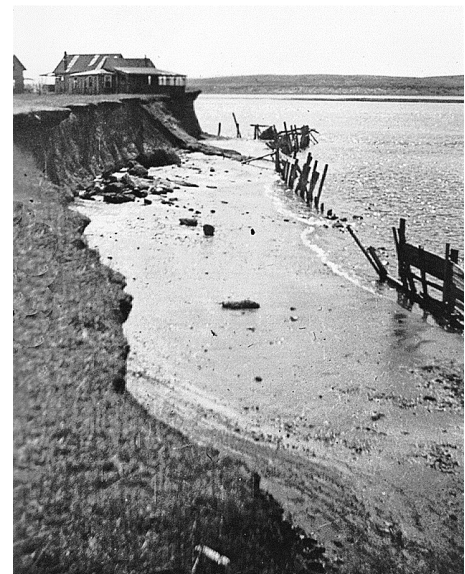
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At the far right is the school house; on the left, the house where Charles and Emma Bayley raised ten children. The big house in the rear also built by the Bayley family.



This cottage was probably a seasonal rental. Note the lobster pots, rain barrel, and the rowing dory. The chimney indicates a stove inside, and the oil drum is likely a rubbish incinerator.



Perhaps the south end of the island with Middle Ground showing between Grape Island and Great Neck in the distance?

Those Big, Beautiful Birds of the Saltmarsh

by Matt Poole, Visitor Services Manager

Spend enough time at Parker River National Wildlife Refuge from spring through fall and you are very likely to notice certain white, elegant-looking birds wading in the pools and creeks of the saltmarsh. To the casual observer, these animals may all look like they are members of a single species. Well, to cut to the chase, there are actually two species commonly found here during the warmer months: great egrets (*Ardea alba*) and snowy egrets (*Egretta thula*). While these two species have much in common — both in appearance and behavior — there are most certainly a number of differences, as well.

First, both egrets are migratory. And both are colonial nesters, constructing similar-looking nests, made of twigs, high up in trees. Often, their rookeries are located on isolated islands, all the more to foil certain would-be predators. Snowy and great egrets have a very similar diet comprised of fish, amphibians, reptiles, crustaceans, and a variety of insects. Each species uses its long narrow bill in a spear-like manner to capture prey.

In terms of field identification, it is very easy to distinguish between the two species. Great egrets are much larger than the snowy, averaging 35 ounces, with a length of 37–41 inches, and an average wingspan of about 54 inches. The great has a yellow-orange bill and black legs. The smaller snowy egret averages 13 ounces, is 22–26 inches in length, and has an average wingspan of 39 inches. The snowy's bill is black with a patch of yellow skin at the base. It has black legs and yellow feet. In short, the discriminating visual cues are not subtle!

For refuge visitors who like to watch and photograph wildlife, the charismatic egrets are a welcome, abundant, and human-tolerant presence in the saltmarsh.



Photo: Matt Poole/FWS

Snowy Egret



Photo: Matt Poole/FWS

Great Egret

Coyotes Find Refuge Here at Parker River!

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cameras. He was only captured on camera twice during daylight hours. I captured a female in mid-February, 2017 and confirmed that the two were mates two days later. The female is both more comfortable around the cameras and willing to eat the bait than her mate. The male began eating the bait in June, after watching his mate safely consume it.

Since first observing the pair together, I had been excitedly hoping they would have pups in the spring. Once April arrived, I saw the female frequently and the male only once a month. I assumed that pups were unlikely since I believed that a nursing female would be absent from the cameras. However, I was pleasantly surprised in June with camera footage of two pups.

Other animals I captured on the cameras include deer, rabbits, raccoons, fishers, mice, woodcock, and various songbirds. Deer were absent from the stations from December to April, likely to avoid the winter storms that weaken them, making them vulnerable to coyote predation. No foxes were captured, likely because the coyotes chased them out of their territory. Fishers and raccoons remained because they can climb to escape. Coyotes benefit from the fisher population since they prey on porcupines, a significant mortality risk for coyotes.

In late April, GOMI Team member Noah Keller and I presented the research findings at the Bresnahan Elementary School's annual STEM Exposition. We educated second- and third-graders about the project using camera trap footage, animal skins, and footprint casts. In July, I presented my project entitled *The Eastern Coyote: A True Survivor* to the Newburyport community at the Parker River National Wildlife Refuge. I enjoyed the opportunity to educate the public about the coyote's history, behavior, and important role in maintaining the health of our local ecosystem.

It's been an amazing experience studying these animals. Coyotes are one of the most persecuted and misunderstood predators, and my research helped document their social and charismatic nature. They keep deer and rodent populations in check, preventing the spread of diseases and increasing crop yields. Coyotes are particularly important to the



Photo: Dominic Noce

Coyote captured at night by trail camera.

Newburyport area because they are vital to maintaining bird diversity by decreasing populations of mesopredators such as foxes, raccoons, and cats. The Parker River National Wildlife Refuge provides key habitat for migrating and nesting shorebirds that attract birders to the area. The Plum Island coyote pack indirectly supports income from bird ecotourism.

This project has provided valuable experience integral to the wildlife biology profession and prepared me to assist in similar projects when I attend college this fall. Camera traps provide vital data by surveying wildlife populations and are much more cost effective than radio telemetry. Fortunately, GOMI is committed to the project. I have trained Noah and GOMI members Kendall Woods and Bailey Fogel to use the camera traps to continue documenting the pack's activity.

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Editor's note:

Domenic Noce will be attending the University of Montana this fall to study terrestrial wildlife biology. He's particularly excited about working with large predators and learning their hunting behavior. He credits his GOMI experience and research here at Parker River National Wildlife Refuge with helping him prepare to achieve his ultimate goal of becoming a wildlife biologist.

Glossy Ibis—One of Our Frequent Summer Visitors

by Linda Schwartz, Volunteer Refuge Naturalist

If you're like me, you probably associate birds such as ibis with Florida. Well, you're in for a pleasant surprise. Glossy ibis (*Plegadis falcinellus*) are a wading bird in the ibis and spoonbill family: Threskiornithidae. Ibis are an elegant-looking bird that has been depicted in a lot of ancient art. The Egyptians even mummified them. They were considered a symbol of the God Thoth. Their most distinguishing feature is their long sickle shaped, down-curved bill, which they use to probe in the mud. You may not see them often or very close, but they are a frequent summer visitor to the refuge and the Great Marsh area of Massachusetts in general.

You may think the ibis is a dull-brown bird, but they have strikingly iridescent bronze wings and a rich brown color during breeding season. Their less prevalent cousin, the white-faced ibis, is also seen occasionally. The differences between the two are mainly that the white-faced ibis has more white on its face where it meets the bill and a thick border surrounding the entire face. White faced ibis also have redder faces and legs, especially in the breeding season. The glossy ibis has dark, yellowish legs. They are known to hybridize in some areas where the ranges of the species overlap.

They are 19–26 inches in length, with a wingspan of 31–41 inches on a mid-sized ibis, they weigh bit over 1 lb to a little over 2 lbs. They live approximately 14–21 years. There was one recorded in New Jersey to be at least 21 years old in the 1980s.



Glossy ibis

Glossy ibis have one of the more widespread ranges of all the ibis, most of which are confined to warmer climates. They are a very nomadic species. You will find Glossy ibis on marshes and wetlands of the Atlantic and Gulf coasts and somewhat inland from those areas, with some populations wandering to the Caribbean and Yucatan Peninsula and Northern Venezuela. They are sometimes found as far west as Wisconsin and Colorado. They are also widespread in Eurasia, Southeast Asia, the Pacific Islands, Africa and Australia. There were estimated to be 13,000–15,000 breeding birds in North America, according to the North American Breeding Bird Survey, in 2014. They are currently considered a species of Least Concern. Potential threats to the species include degradation of wetlands, drainage, increased salinity, and invasion of habitats by exotic plants. They nest as far north as Maine and occasionally into the Maritime Provinces — a remarkable range expansion.

The White-faced ibis, with a more western United States distribution, has not done as well and has struggled to recover from losses brought about by DDT. The glossy ibis is thought to have originated in the Old World and spread to South America. It was first found in New Jersey in 1817. John James Audubon recorded it in Florida in 1832 and it expanded its range northward in the 1940's and to the west in the 1980s.

The nest is usually a platform of twigs and vegetation positioned at least 3 feet above water, sometimes up to 23 feet high, in tall, dense stands of young vegetation, low trees or bushes or even on the ground, on islands. Glossy ibis nest in colonies, frequently with other species of wading birds. They lay 3–4 eggs (occasionally 5) and they are an equal opportunity species, with both parents incubating and feeding the young. The parents feed them by regurgitation. Their incubation period is 20–23 days and they fledge at approximately 28 days, with the parents continuing to feed them for a few weeks. They can leave the nest as early as their second week and they will often clamber about, near the nest, until they are able to fly at about 4 weeks.

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Meet Volunteer John Lozowski

by Jean Adams, Outdoor Recreation Planner

If you are at Sandy Point on any Saturday morning from April through August you'll always see volunteer Plover Warden John Lozowski. In all kinds of weather, through the onslaught of greenheads, John is there for the full four hours. Every Saturday without fail he's there protecting the south boundary of the refuge.

John became a volunteer 8 years ago when he saw an article about the plovers in the newspaper. Since that time, he has come to look forward to his shift at the south end. I must say that, for the 4½ months of piping plover season, there are very few volunteers more dedicated to the cause.

Why does John enjoy volunteering so much? Perhaps it's because there's a huge difference between what John does for a living (working for the IRS) and being out on the pristine beach on early Saturday mornings. John really is committed to helping the plovers be successful. There are very few out there that would tolerate the brutally raw beach days in early spring or the searing heat of a summer weekend and do it with a smile, but he does. Indeed, it is almost like we are doing HIM the favor instead of the other way around!

I saw John on his last Saturday of plover season just this past Saturday and the last thing he said to me was "I'm already looking forward to next season!" Now that's a dedicated volunteer! Thank you, John!



Photo: Jean Adams/FWS

Volunteer plover warden John Lozowski

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Coyotes Find Refuge Here...



Photo: Dominic Noce

No, this is NOT a coyote; it's a fisher. According to the [Mass Audubon](#), the fisher is the second largest member of the weasel family found in Massachusetts; only the river otter is larger. Although many people call them "fisher cats," the name is inappropriate. They are neither members of the feline family, nor do they catch fish.

Never know what you'll catch with your trail camera!

A Quick Overview on Red Tides

by Olivia Barbera, sixth-grade student at the River Valley Charter School

A sixth-grade thesis project

Do you know what a red tide is? In the past, all I knew was that the ocean turned red and things died. Now, I know much, much more.

There's a cool beach in Florida that my family calls "Gilligan's Island" after that 1970s TV show. Whenever we visit my grandparents at their house in Florida's panhandle, we always stop at the beach. Palm trees are blown over, the beach is narrow and short, and you always find something interesting there.

Last year, my cousin Ellen rescued a sea turtle from a red tide. She was walking down that same beach and spotted the turtle a little ways out in the water. She said he was swimming in tight circles and looked distressed from the effects of the red tide. Being a biologist, she knew to call Wildlife Services; however, they wouldn't take the animal. They said it had to be on shore. So, my cousin waded waist-deep into the cool February waters wearing only a pair of shorts and a t-shirt to bring the turtle to shore. A Wildlife Service representative then came to pick up the turtle, and it was taken into care by the animal rehabilitation center at Gulf World.

This story inspired me to do this project, and write this paper...

So, what exactly is a red tide? In the right conditions, algae (both toxic and nontoxic) can bloom over the ocean surface. When the toxic algae blooms, it can poison people and other animals, such as sea turtles. This, as you might imagine, can cause some harm. The name "red tide" can be misleading, because a red tide is not always red, and does not necessarily come in with the tide. Depending on the region, the water might appear to be tinted different colors, such as deep brown, greenish, yellowish, murky, or even untinted. It all depends on the pigment and, therefore, the subspecies of the

algae. The term "red tide" is mainly used in the Gulf of Maine and the Gulf of Mexico because the water becomes tinted a reddish, rusty color. In other regions, the scientific name, "Harmful Algal Bloom", or HAB, is used.

Red tides can happen all over the world. They are just as common here in Massachusetts as they are in New Zealand. Red tides can occur anywhere coastal, or in large bodies of freshwater. In fact, red tides have been reported in every US coastal and Great Lakes state. However, in some places red tides occur almost every year. In Florida, the conditions are ideal for a red tide, and in the spring and summer time, a red tide is very likely. But for tropical places, a red tide can happen year round, although still typically happen in the warmest parts of the year. The cause of the Florida red tide is a species of alga called *Karenia Brevis*, or *K. Brevis*. In other places, different subspecies of the algae cause the red tide. For example, in New England, a subspecies of algae called *Alexandrium fundyense* is the cause of the majority of the red tides.

The cause of a red tide, as previously mentioned, is algae. More specifically, Phytoplankton. And even more specifically, a branch of Phytoplankton called Dinoflagellates. Dinoflagellates may be simple algae, but there is a lot more to single-celled organisms than you may think. Dinoflagellates belong to the Protista Kingdom, which means that they are something that scientists classify as neither a plant or an animal. They are a lot like plants in the sense that they use photosynthesis. This means that the Dinoflagellates harvest the sun's light through the nucleus and create it into nutrients. This explains why they thrive mostly in the spring and summer time and tropical areas; because that's when and where it is warmest and easiest to collect nutrients.

Not all Dinoflagellates are toxic. In fact, of the approximately two thousand species of Dinoflagellates, only about thirty species contain the natural toxins. Almost all Dinoflagellates live in saltwater, but there are a few that call freshwater their home.

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A Quick Overview on Red Tides

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This means that almost all red tides happen in the ocean, or other bodies of saltwater.

The Dinoflagellates can poison in three different ways. The first way is through direct consumption of the Phytoplankton itself. It is very rare to get sick in this way, considering the amount of toxic algae water you must consume. The second way is to get poisoned through the airborne version of the toxin. Sometimes, if you are on the beach or close to a red tide, you can become sick from the airborne effects of the red tide. When the waves roll in, the Dinoflagellates can burst open from the pressure of the wave and release the toxins in the air. Then you breathe in the toxins, and can experience the symptoms, which typically include minor respiratory issues such as labored breathing, or dizziness and lightheadedness. You may also experience burning or tearing eyes. The effects usually wear off in a couple hours after your departure. However, if you have a respiratory condition such as bronchitis, severe asthma, or lung cancer, you can experience more severe or fatal effects.

The third and last way to get poisoned is through shellfish, or NSP (Neurotoxic Shellfish Poisoning). Since some shellfish such as clams, oysters, and mussels are filter feeders, the red tide toxins get absorbed into their tissues, making them toxic to humans. This is the most common way for humans to get poisoned by red tide. The issue is that the toxins cannot be destroyed through cooking, and so local shellfish (or really any local seafood), is not safe to eat during a red tide, and must be shipped from a non- red tide region.

Not just humans can be poisoned by the red tide. Animals can, too. The illness can affect all sorts of animals, including fish, manatees, dolphins, whales, sea turtles, birds, etc. During a red tide, you can find hundreds of dead fish, washed up and lifeless on the beach. The fish breathe in the toxins, and it goes to their nervous system and paralyzes them, causing them to stop breathing and die. In 2013, two hundred and seventy- six manatees died off of Southwestern Florida, one contribution to the record-breaking eight hundred and twenty- nine manatees that died that year. One hundred and seventy- four whales died of a red tide in Cape Cod, Massachusetts



in 1987. Traces of red tide toxins can be found in dolphins liver, kidney, lungs, muscle and blubber tissue, and stomach.

Sea turtles affected by red tides may exhibit swimming in tight circles, lack of body control, head bobbing, muscle twitching, jerky body movements, and extreme lethargy and loss of energy. Sea turtle strandings off of Florida's central- west coast in 2005 and 2006 increased twenty-five times the average amount because of red tides, with three- hundred sea turtle strandings in comparison to a twelve per year average.

Seabirds such as double- crested cormorants, lesser scaup, and the brown pelican are often victims of the red tide. Seabirds often get airborne sick, or eat infected animals and find themselves unable to stand, slumping their heads, weak, unwilling to fly, having seizures, and difficulty breathing.

Alongside of all of this, the industry is affected by red tides, too. A study conducted in 1975 says that each Florida red tide can cost from fifteen to eighteen million dollars, plus an extra two million for beach cleanup. Around here in Massachusetts, when a red tide strikes, it means serious money lost in the clamming industry. Locally, you can find clamming flats in Newburyport, Newbury, Salisbury, Amesbury, and other towns, but Ipswich is especially well known for clamming. When a red tide occurs, clambers are informed and are required to stop working, usually for four to six weeks until the red tide passes. Since clamming is an independent vocation, clambers make no income for this time. Say you are a clammer, and you make \$300 per day on clams.

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A Brief History of Now Long-Forgotten Grape Island

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We know Grape Island to have been a year-round community for 300 years (and seasonally occupied for eons prior by indigenous people), but it was in the 1920s that a dramatic decline in full-time islanders took place. In part, this is attributed to the automobile, vastly expanding the range of vacationers; to Prohibition shutting down the dance hall and casino; and then to the Depression. In 1935, a fire

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Suddenly a red tide occurs, and you are restricted from clamming for four weeks. You've just lost \$8,400. The clambers dig all year round, but the demand for clams is mainly in the summer, which is when a red tide strikes around here. That means that during the part of the year where clams are most valuable, a red tide can mean a big loss.

One of the worst red tides locally was in 2005, when there was a massive shellfish disaster. The toxicity levels were record breaking; one dish worth of shellfish was enough to be fatal. This red tide stretched all the way from Maine to Nantucket, over 67,000 square kilometers, (which is a size larger than West Virginia) and was 30 miles wide in some places. The clamming industries were shut down for so long, it cost five million dollars in Federal Disaster Assistance Funds, and is thought of as the worst red tide in all of New England, and to some, the worst in the USA, and maybe even worldwide.

Red tides have been going on for, well, nobody really knows how long. If you think about it, red tides could have been going on since the dawn of time. Some scientists say that there is reference in the Bible with the Nile turning to blood in the Exodus story. Others say that the first ones were off Florida's coast, documented in a Spanish Explorer's journal as stories of "red water" that brings death to birds and fish, as told by Florida natives. But the first officially documented red tide was off of Florida's coast in 1530.

I have learned so much about red tides, and have had such a good time researching them. I hope you took as much away from this as I have, and learned a little something new.

destroyed the north-end hotel and many of its out-buildings and, in 1936, the Audubon bought much of the acreage at the southern end of Plum Island. An exceptional ocean storm in 1955 took most of the remaining abandoned homes. The difficult access to the island became less and less tolerable to vacationing mainlanders. Stephanie Cobb recalls her father, Howard Cobb (of the Bayley family), would drive from Ipswich to the Knobbs (see map), walk to Grape across the frequently wet connector to pick up his row boat, row back to the Knobbs to collect his gear, and then return to the island.

Grape Island has also experienced dramatic coastal erosion resulting in significant loss of land mass. Look at the map and see what is locally known as Middle Ground. This ever shifting sandbar in the center of Plum Island Sound effects the ebb and flow of the north Atlantic tides, which some years dig out deep channels on either and sometimes both sides. Depending on all the variables that affect barrier beaches and their nearby waters, these channels can severely impact the seaside dunes and bluffs and despite man made attempts to stabilize the shore-front (see the ineffectiveness of the wooden bulkhead), cottages were frequently lost to storms.

Grape Island's marshes support shorebirds and ducks and the maritime forest provides good nesting and migrating habitat for songbirds. There are no trails or paths to provide access for walking or wildlife viewing, and landing a boat on Refuge property is prohibited.



Head of the Island. These summer cottages later fell into the Sound as the banks eroded. Notice the bulkhead hoping to stabilize the dune.

2017 Piping Plover Summary

by Kaytee Hojnacki, Biological Technician

This wasn't the greatest year for piping plovers at Parker River NWR. Predation and flooding were both major adversaries early in the season. Many nests were washed out during the Memorial Day weekend storm, and a pair of ravens had themselves quite a breakfast when they consumed 10 nests in a single morning. Coyotes, crows, grackles, and gulls also helped themselves to the plover (and least tern) eggs. The plovers tried again and many of these nests were exclosed, protecting the eggs from hungry mouths. Although the eggs survived to hatch, they didn't do so until late in the season (mid-July). We noticed that many broods were down to only one adult (the other most likely left for migration), and with just one parent the chicks become more susceptible to predators and the elements. Many of these chicks did not survive, leading to a significantly lower fledgling count than last year. Around here though, we like to look on the bright side. Our 48 nesting pairs was the highest number ever recorded at Parker River NWR, and our 53 fledglings was our third highest number ever.

Glossy Ibis...

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When fledged, they may join the parents in foraging. In temperate regions, such as here, they breed between March and May

Their diet consists mainly of insects and crustaceans they find by probing in mud of freshwater or brackish wetlands. They may also eat leeches, snails, frogs, crabs and fish and have been reported to eat small snakes as well. They can be seen out feeding in the marshy areas of the refuge on occasion. They are the only member of the ibis family that you are likely to see at the refuge.



Photo: Matt Poole/FWS)

Adult piping plover

Year	Number of Breeding Pairs	Number of Fledglings	Productivity (Fledglings per pair)
2013	32	43	1.34
2014	31	59	1.9
2015	37	45	1.22
2016	47	77	1.64
2017	48	53	1.1
5-year Average	39	55.4	1.42

Figure 1. Summary of piping plover numbers on the refuge beach over the past five years.

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